



BACKGROUND OF THE INVENTION

[0001] The present invention relates to a non-contact-type electronic card which records personal information requiring security with respect to prevention of such as forgery or alternation, or a personal certification card that is suitably applied to a sheet.

[0002] As an identification card (ID card) or a credit card, a magnetic card which records data by means of a conventional magnetic recording method has been commonly utilized. However, a magnetic card had problems of insufficient anti-tampering with data due to the ease of rewriting of the data, of insufficient protection of data due to environmental susceptibility of magnetic record and of insufficient memory capacity.

[0003] Therefore, an IC card including an IC-chip has become popular in recent years. An IC card exchanges data with external equipment by reading and writing, through an electric connection provided on the surface or a loop antenna in the card. An IC card is provided with larger memory capacity compared to a magnetic card and has been significantly improved also in security. Particularly, a noncontact-type IC card, which is provided with an antenna inside the card and without having an electric connection outside the card, is superior in security compared to a contact-type IC card which has an electric connection on the card surface, and has become to be utilized in such application as an IC card which highly requires secrecy and prevention of forgery or alternation.

[0004] As such an IC card, for example, there is known a card in which the first sheet material and the second sheet material are laminated sandwiching an adhesive and an IC module including an IC-chip and an antenna are sealed in the adhesive layer.

[0005] Since an IC card requires high security, durability of an IC card has become important in respect to prevention of forgery or alternation. Particularly, since an electric part such as an antenna for information exchange between an IC-chip and the outside are included inside the card, various attempts to assure durability thereof has been performed. However, in accordance with becoming popular in various applications, further high durability has been required. Owing to characteristics of a card that may be usually carried, strong durability is required against repeated bending such as in a pocket of trousers, dropping, or pressure by such as coins. To satisfy such requirements, improvement such as to provide a strong reinforcement structure in an IC-chip has been proposed.

[0006] However, although a limited improvement of durability was observed, there caused problems in that sufficient durability was not obtained in various situations, for example, in respect to such as durability against impact with rapid stress, repeated bending durability with repeated stress, and repeated localized load, resulting in a break of an IC-chip or a break of a card to make electric

OK to enter 1/18 6/21/2005